

DATA SHEET

For a complete data sheet, please also download:

- The IC06 74HC/HCT/HCU/HCMOS Logic Family Specifications
- The IC06 74HC/HCT/HCU/HCMOS Logic Package Information
- The IC06 74HC/HCT/HCU/HCMOS Logic Package Outlines

74HC/HCT4067 16-channel analog multiplexer/demultiplexer

Product specification
File under Integrated Circuits, IC06

September 1993

16-channel analog multiplexer/demultiplexer

74HC/HCT4067

FEATURES

- Low "ON" resistance:
80 Ω (typ.) at $V_{CC} = 4.5$ V
70 Ω (typ.) at $V_{CC} = 6.0$ V
60 Ω (typ.) at $V_{CC} = 9.0$ V
typical "break before make" built-in
- Output capability: non-standard
- I_{CC} category: MSI

GENERAL DESCRIPTION

The 74HC/HCT4067 are high-speed Si-gate CMOS devices and are pin compatible with the "4067" of the "4000B" series. They are specified in compliance with JEDEC standard no. 7A.

The 74HC/HCT4067 are 16-channel analog multiplexers/demultiplexers with four address inputs (S_0 to S_3), an active LOW enable input (\bar{E}), sixteen independent inputs/outputs (Y_0 to Y_{15}) and a common input/output (Z). The "4067" contains sixteen bidirectional analog switches, each with one side connected to an independent input/output (Y_0 to Y_{15}) and the other side connected to a common input/output (Z).

With \bar{E} LOW, one of the sixteen switches is selected (low impedance ON-state) by S_0 to S_3 . All unselected switches are in the high impedance OFF-state. With \bar{E} HIGH, all switches are in the high impedance OFF-state, independent of S_0 to S_3 .

The analog inputs/outputs (Y_0 to Y_{15} , and Z) can swing between V_{CC} as a positive limit and GND as a negative limit. V_{CC} to GND may not exceed 10 V.

QUICK REFERENCE DATA

$GND = 0$ V; $T_{amb} = 25$ °C; $t_r = t_f = 6$ ns

| SYMBOL | PARAMETER | CONDITIONS | TYPICAL | | UNIT |
|-------------------|---|--|---------|-----|------|
| | | | HC | HCT | |
| t_{PZL}/t_{PZH} | turn-on time \bar{E} to V_{os} S_n to V_{os} | $C_L = 15$ pF; $R_L = 1$ k Ω ; $V_{CC} = 5$ V | 26 | 32 | ns |
| | | | 29 | 33 | ns |
| t_{PLZ}/t_{PHZ} | turn-off time \bar{E} to V_{os} S_n to V_{os} | | 27 | 26 | ns |
| | | | 29 | 30 | ns |
| C_I | input capacitance | | 3.5 | 3.5 | pF |
| C_{PD} | power dissipation capacitance per switch | notes 1 and 2 | 29 | 29 | pF |
| C_S | max. switch capacitance independent (Y) | | 5 | 5 | pF |
| | common (Z) | | 45 | 45 | pF |

Notes

1. C_{PD} is used to determine the dynamic power dissipation (P_D in μ W):

$$P_D = C_{PD} \times V_{CC}^2 \times f_i + \sum \{ (C_L + C_S) \times V_{CC}^2 \times f_o \} \text{ where:}$$

f_i = input frequency in MHz

f_o = output frequency in MHz

$\sum \{ (C_L + C_S) \times V_{CC}^2 \times f_o \}$ = sum of outputs

C_L = output load capacitance in pF

C_S = max. switch capacitance in pF

V_{CC} = supply voltage in V

2. For HC the condition is $V_I = GND$ to V_{CC}
For HCT the condition is $V_I = GND$ to $V_{CC} - 1.5$ V

16-channel analog multiplexer/demultiplexer

74HC/HCT4067

ORDERING INFORMATION

See "74HC/HCT/HCU/HCMOS Logic Package Information".

PIN DESCRIPTION

| PIN NO. | SYMBOL | NAME AND FUNCTION |
|--|-------------------|----------------------------|
| 1 | Z | common input/output |
| 9, 8, 7, 6, 5, 4, 3, 2, 23, 22, 21, 20, 19, 18, 17, 16 | Y_0 to Y_{15} | independent inputs/outputs |
| 10, 11, 14, 13 | S_0 to S_3 | address inputs |
| 12 | GND | ground (0 V) |
| 15 | \bar{E} | enable input (active LOW) |
| 24 | V_{CC} | positive supply voltage |

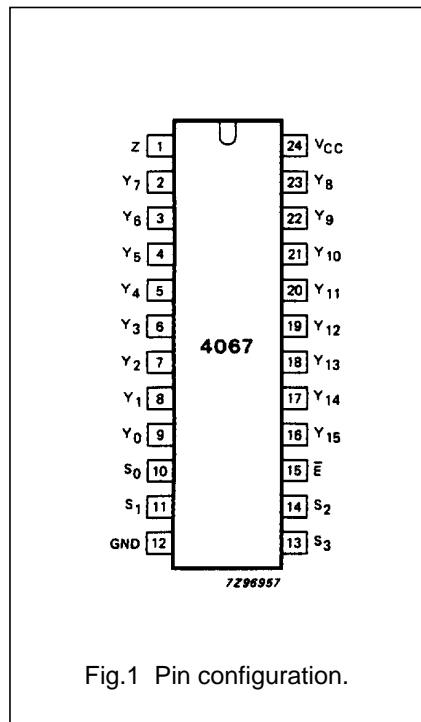


Fig.1 Pin configuration.

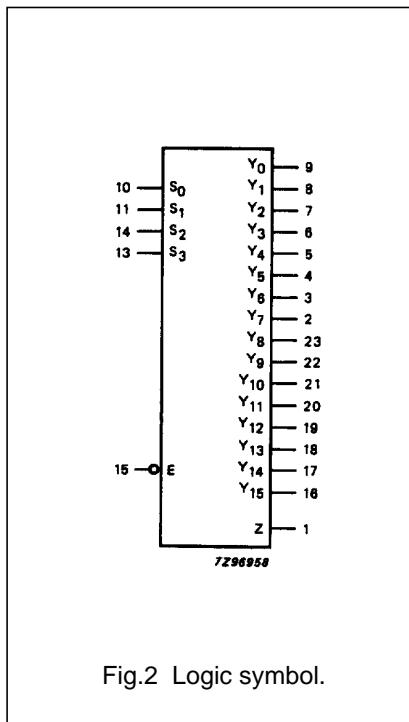


Fig.2 Logic symbol.

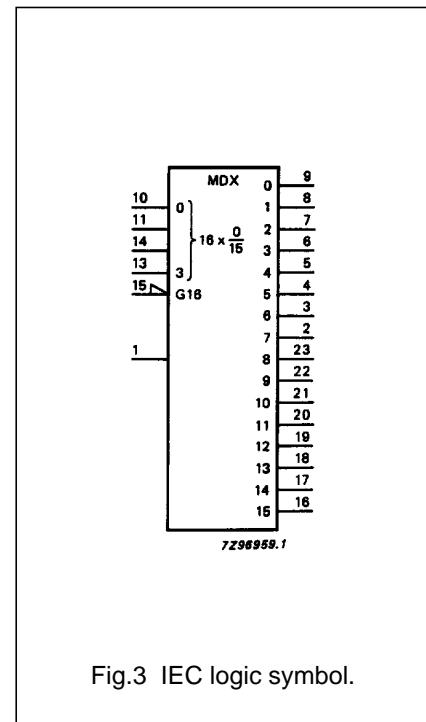


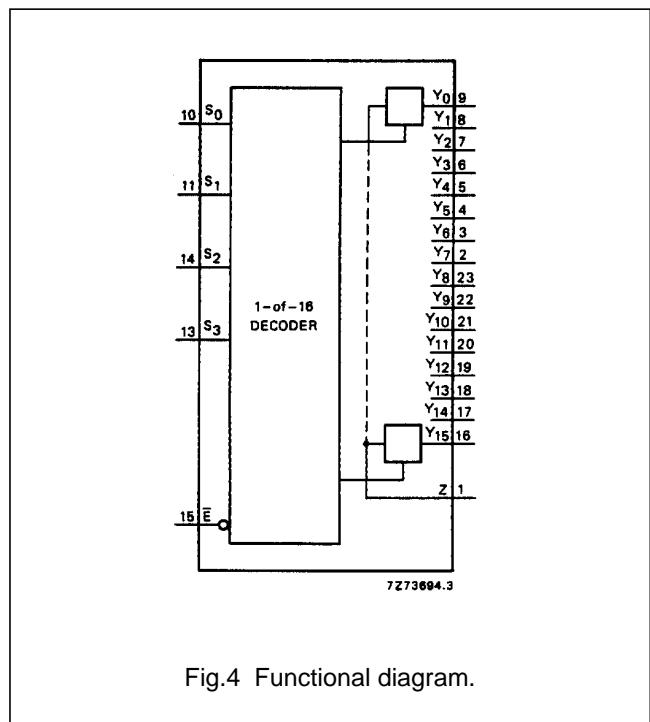
Fig.3 IEC logic symbol.

16-channel analog multiplexer/demultiplexer

74HC/HCT4067

APPLICATIONS

- Analog multiplexing and demultiplexing
- Digital multiplexing and demultiplexing
- Signal gating

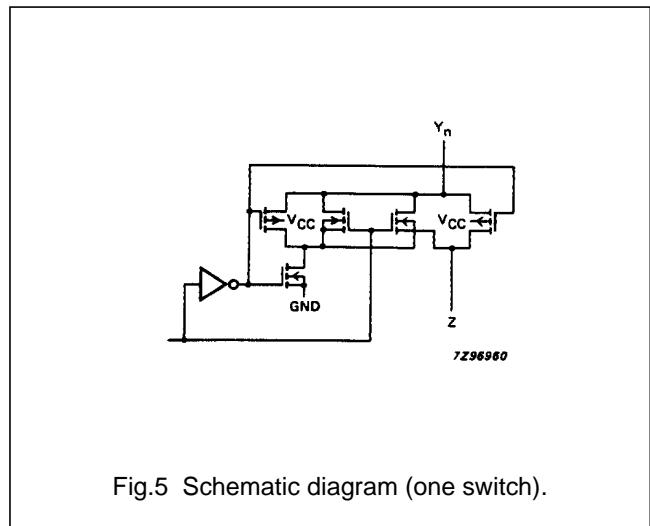


FUNCTION TABLE

| \bar{E} | INPUTS | | | | | CHANNEL ON |
|-----------|--------|-------|-------|-------|--|---------------|
| | S_3 | S_2 | S_1 | S_0 | | |
| L | L | L | L | L | | $Y_0 - Z$ |
| L | L | L | L | H | | $Y_1 - Z$ |
| L | L | L | H | L | | $Y_2 - Z$ |
| L | L | L | H | H | | $Y_3 - Z$ |
| L | L | H | L | L | | $Y_4 - Z$ |
| L | L | H | L | H | | $Y_5 - Z$ |
| L | L | H | H | L | | $Y_6 - Z$ |
| L | L | H | H | H | | $Y_7 - Z$ |
| L | H | L | L | L | | $Y_8 - Z$ |
| L | H | L | L | H | | $Y_9 - Z$ |
| L | H | L | H | L | | $Y_{10} - Z$ |
| L | H | L | H | H | | $Y_{11} - Z$ |
| L | H | H | L | L | | $Y_{12} - Z$ |
| L | H | H | L | H | | $Y_{13} - Z$ |
| L | H | H | H | L | | $Y_{14} - Z$ |
| L | H | H | H | H | | $Y_{15} - Z$ |
| H | X | X | X | X | | none |

Notes

1. H = HIGH voltage level
L = LOW voltage level
X = don't care



16-channel analog
multiplexer/demultiplexer

74HC/HCT4067

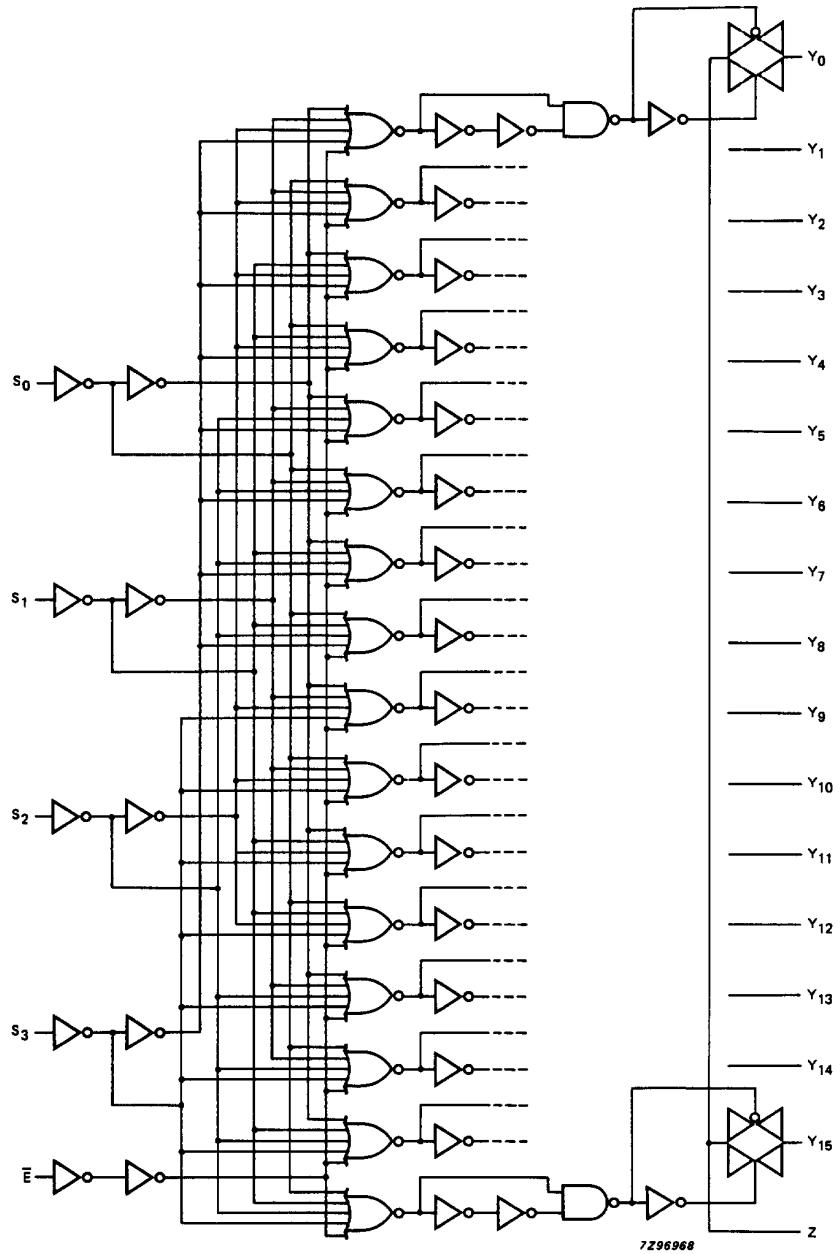


Fig.6 Logic diagram.

16-channel analog multiplexer/demultiplexer

74HC/HCT4067

RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

Voltages are referenced to GND (ground = 0 V)

| SYMBOL | PARAMETER | MIN. | MAX. | UNIT | CONDITIONS |
|---------------------------|--------------------------------|------|-------|------|---|
| V_{CC} | DC supply voltage | -0.5 | +11.0 | V | |
| $\pm I_{IK}$ | DC digital input diode current | | 20 | mA | for $V_I < -0.5$ or $V_I > V_{CC} + 0.5$ V |
| $\pm I_{SK}$ | DC switch diode current | | 20 | mA | for $V_S < -0.5$ or $V_S > V_{CC} + 0.5$ V |
| $\pm I_S$ | DC switch current | | 25 | mA | for -0.5 V < V_S < $V_{CC} + 0.5$ V |
| $\pm I_{CC}; \pm I_{GND}$ | DC V_{CC} or GND current | | 50 | mA | |
| T_{stg} | storage temperature range | -65 | +150 | °C | |
| P_{tot} | power dissipation per package | | | | for temperature range: -40 to +125 °C 74HC/HCT |
| | plastic DIL | | 750 | mW | above +70 °C: derate linearly with 12 mW/K |
| | plastic mini-pack (SO) | | 500 | mW | above +70 °C: derate linearly with 8 mW/K |
| P_S | power dissipation per switch | | 100 | mW | |

Note

1. To avoid drawing V_{CC} current out of terminal Z, when switch current flows in terminals Y_n , the voltage drop across the bidirectional switch must not exceed 0.4 V. If the switch current flows into terminal Z, no V_{CC} current will flow out of terminals Y_n . In this case there is no limit for the voltage drop across the switch, but the voltages at Y_n and Z may not exceed V_{CC} or GND.

RECOMMENDED OPERATING CONDITIONS

| SYMBOL | PARAMETER | 74HC | | | 74HCT | | | UNIT | CONDITIONS |
|------------|-------------------------------------|------|------|---------------------------|-------|------|----------|------|---|
| | | min. | typ. | max. | min. | typ. | max. | | |
| V_{CC} | DC supply voltage | 2.0 | 5.0 | 10.0 | 4.5 | 5.0 | 5.5 | V | |
| V_I | DC input voltage range | GND | | V_{CC} | GND | | V_{CC} | V | |
| V_S | DC switch voltage range | GND | | V_{CC} | GND | | V_{CC} | V | |
| T_{amb} | operating ambient temperature range | -40 | | +85 | -40 | | +85 | °C | see DC and AC CHARACTERISTICS |
| T_{amb} | operating ambient temperature range | -40 | | +125 | -40 | | +125 | °C | |
| t_r, t_f | input rise and fall times | | 6.0 | 1000 500 400 250 | | 6.0 | 500 | ns | $V_{CC} = 2.0$ V $V_{CC} = 4.5$ V $V_{CC} = 6.0$ V $V_{CC} = 10.0$ V |

16-channel analog multiplexer/demultiplexer

74HC/HCT4067

DC CHARACTERISTICS FOR 74HC/HCT

For 74HC: $V_{CC} - GND = 2.0, 4.5, 6.0$ and 9.0 V For 74HCT: $V_{CC} - GND = 4.5\text{ V}$

| SYMBOL | PARAMETER | T_{amb} ($^{\circ}\text{C}$) | | | | | | UNIT | TEST CONDITIONS | | | | | | | |
|-----------------|---|----------------------------------|------|------|------------|------|-------------|------|------------------------|-------------------------------------|-----------------|-----------------|----------------------|--|--|--|
| | | 74HC/HCT | | | | | | | V _{CC} (V) | I _S (μA) | V _{IS} | V _I | | | | |
| | | +25 | | | -40 to +85 | | -40 to +125 | | | | | | | | | |
| | | min. | typ. | max. | min. | max. | min. | max. | | | | | | | | |
| R_{ON} | ON-resistance (peak) | — | 110 | 180 | — | 225 | — | 270 | Ω | 2.0 | 100 | V_{CC} to GND | V_{IH} or V_{IL} | | | |
| | | 95 | 160 | 200 | 240 | 240 | 195 | 195 | Ω | 4.5 | 1000 | | | | | |
| | | 75 | 130 | 165 | 175 | 180 | 180 | 180 | Ω | 6.0 | 1000 | | | | | |
| | | | | | | | | | Ω | 9.0 | 1000 | | | | | |
| R_{ON} | ON-resistance (rail) | 150 | — | — | — | — | — | — | Ω | 2.0 | 100 | GND or V_{CC} | V_{IH} or V_{IL} | | | |
| | | 90 | 160 | 200 | 240 | 240 | 210 | 210 | Ω | 4.5 | 1000 | | | | | |
| | | 80 | 140 | 175 | 210 | 210 | 180 | 180 | Ω | 6.0 | 1000 | | | | | |
| | | 70 | 120 | 150 | 180 | 180 | 180 | 180 | Ω | 9.0 | 1000 | | | | | |
| ΔR_{ON} | maximum variation of ON-resistance between any two channels | — | 9 | — | — | — | — | — | Ω | 2.0 | | V_{CC} to GND | V_{IH} or V_{IL} | | | |
| | | 8 | — | — | — | — | — | — | Ω | 4.5 | | | | | | |
| | | 6 | — | — | — | — | — | — | Ω | 6.0 | | | | | | |
| | | | | | | | | | Ω | 9.0 | | | | | | |

Notes

1. At supply voltages ($V_{CC} - GND$) approaching 2 V, the analog switch ON-resistance becomes extremely non-linear. Therefore it is recommended that these devices be used to transmit digital signals only, when using these supply voltages.
2. For test circuit measuring R_{ON} see Fig.7.

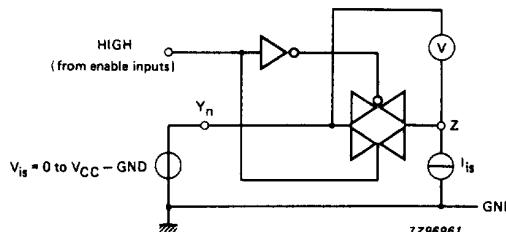
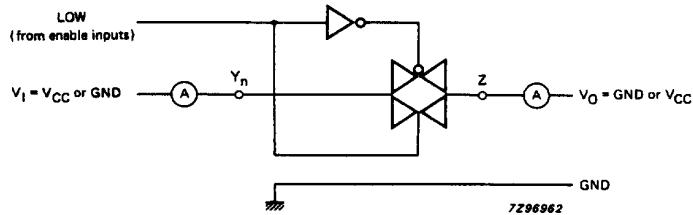
Fig.7 Test circuit for measuring ON-resistance (R_{ON}).

Fig.8 Test circuit for measuring OFF-state current.

16-channel analog multiplexer/demultiplexer

74HC/HCT4067

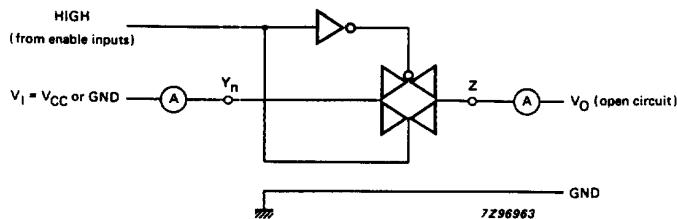


Fig.9 Test circuit for measuring ON-state current.

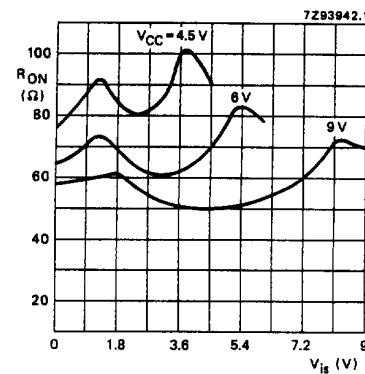


Fig.10 Typical ON-resistance (R_{ON}) as a function of input voltage (V_{is}) for $V_{is} = 0$ to $V_{CC} - GND$.

DC CHARACTERISTICS FOR 74HC

Voltages are referenced to GND (ground = 0 V)

| SYMBOL | PARAMETER | T_{amb} ($^{\circ}C$) | | | | | | UNIT | TEST CONDITIONS | | | | | |
|-----------------|--|---------------------------|--------------------------|--------------------------|------------------------------|-------------|------------------------------|------------|---------------------|--------------------------|------------------------------------|---|--|--|
| | | 74HC | | | | | | | V _{CC} (V) | V _I | OTHER | | | |
| | | +25 | | | -40 to +85 | | -40 to +125 | | | | | | | |
| | | min. | typ. | max. | min. | max. | min. | max. | | | | | | |
| V _{IH} | HIGH level input voltage | 1.5 3.15 4.2 6.3 | 1.2 2.4 3.2 4.7 | | 1.5 3.15 4.2 6.3 | | 1.5 3.15 4.2 6.3 | | V | 2.0 4.5 6.0 9.0 | | | | |
| V _{IL} | LOW level input voltage | | | 0.8 2.1 2.8 4.3 | 0.50 1.35 1.80 2.70 | | 0.50 1.35 1.80 2.70 | | V | 2.0 4.5 6.0 9.0 | | | | |
| $\pm I_l$ | input leakage current | | | 0.1 0.2 | | 1.0 2.0 | | 1.0 2.0 | μA | 6.0 10.0 | V _{CC} or GND | | | |
| $\pm I_s$ | analog switch OFF-state current per channel | | | 0.1 | | 1.0 | | 1.0 | μA | 10.0 | V _{IH} or V _{IL} | $ V_S = V_{CC} - GND$ (see Fig.8) | | |
| $\pm I_s$ | analog switch OFF-state current all channels | | | 0.8 | | 8.0 | | 8.0 | μA | 10.0 | V _{IH} or V _{IL} | $ V_S = V_{CC} - GND$ (see Fig.9) | | |
| $\pm I_s$ | analog switch ON-state current | | | 0.8 | | 8.0 | | 8.0 | μA | 10.0 | V _{IH} or V _{IL} | $ V_S = V_{CC} - GND$ (see Fig.9) | | |
| I _{CC} | quiescent supply current | | | 8.0 16.0 | | 80.0 160 | | 160 320 | μA | 6.0 10.0 | V _{CC} or GND | $V_{is} = GND$ or V_{CC} ; $V_{os} = V_{CC}$ or GND | | |

16-channel analog multiplexer/demultiplexer

74HC/HCT4067

AC CHARACTERISTICS FOR 74HC

GND = 0 V; $t_r = t_f = 6$ ns; $C_L = 50$ pF

| SYMBOL | PARAMETER | T _{amb} (°C) | | | | | | UNIT | TEST CONDITIONS | | | |
|-------------------------------------|--|-----------------------|----------------------|-----------------------|------------|-----------------------|-------------|-----------------------|---------------------|--------------------------|---|--|
| | | 74HC | | | | | | | V _{CC} (V) | OTHER | | |
| | | +25 | | | -40 to +85 | | -40 to +125 | | | | | |
| | | min. | typ. | max. | min. | max. | min. | max. | | | | |
| t _{PHL} / t _{PLH} | propagation delay V _{is} to V _{os} ; Y _n to Z | | 25 9 7 5 | 75 15 13 9 | | 95 19 16 11 | | 110 22 19 14 | ns | 2.0 4.5 6.0 9.0 | R _L = ∞ ; C _L = 50 pF (see Fig.16) | |
| t _{PHL} / t _{PLH} | propagation delay V _{is} to V _{os} ; Z to Y _n | | 18 6 5 4 | 60 12 10 8 | | 75 15 13 10 | | 90 18 15 12 | ns | 2.0 4.5 6.0 9.0 | | |
| t _{PHZ} / t _{PLZ} | turn-off time E to Y _n | | 74 27 22 20 | 250 50 43 38 | | 315 63 54 48 | | 375 75 64 57 | ns | 2.0 4.5 6.0 9.0 | | |
| t _{PHZ} / t _{PLZ} | turn-off time S _n to Y _n | | 83 30 24 21 | 250 50 43 38 | | 315 63 54 48 | | 375 75 64 57 | ns | 2.0 4.5 6.0 9.0 | | |
| t _{PHZ} / t _{PLZ} | turn-off time E to Z | | 85 31 25 24 | 275 55 47 42 | | 345 69 59 53 | | 415 83 71 63 | ns | 2.0 4.5 6.0 9.0 | | |
| t _{PHZ} / t _{PLZ} | turn-off time S _n to Z | | 94 34 27 25 | 290 58 47 45 | | 365 73 62 56 | | 435 87 74 68 | ns | 2.0 4.5 6.0 9.0 | | |
| t _{PZH} / t _{PZL} | turn-on time E to Y _n | | 80 29 23 17 | 275 55 47 42 | | 345 69 59 53 | | 415 83 71 63 | ns | 2.0 4.5 6.0 9.0 | | |
| t _{PZH} / t _{PZL} | turn-on time S _n to Y _n | | 88 32 26 18 | 300 60 51 45 | | 375 75 64 56 | | 450 90 77 68 | ns | 2.0 4.5 6.0 9.0 | | |
| t _{PZH} / t _{PZL} | turn-on time E to Z | | 85 31 25 18 | 275 55 47 42 | | 345 69 59 53 | | 415 83 71 63 | ns | 2.0 4.5 6.0 9.0 | | |
| t _{PZH} / t _{PZL} | turn-on time S _n to Z | | 94 34 27 19 | 300 60 51 45 | | 375 75 64 56 | | 450 90 77 68 | ns | 2.0 4.5 6.0 9.0 | | |

16-channel analog multiplexer/demultiplexer

74HC/HCT4067

Note to AC CHARACTERISTICS FOR 74HC

1. Due to higher Z terminal capacitance (16 switches versus 1) the delay figures to the Z terminal are higher than those to the Y terminal.

DC CHARACTERISTICS FOR 74HCT

Voltages are referenced to GND (ground = 0 V)

| SYMBOL | PARAMETER | T _{amb} (°C) | | | | | | UNIT | TEST CONDITIONS | | | | | |
|------------------|---|-----------------------|------|------|------------|------|-------------|------|---------------------|----------------|------------------------------------|---|--|--|
| | | 74HCY | | | | | | | V _{CC} (V) | V _I | OTHER | | | |
| | | +25 | | | -40 to +85 | | -40 to +125 | | | | | | | |
| | | min. | typ. | max. | min. | max. | min. | max. | | | | | | |
| V _{IH} | HIGH level input voltage | 2.0 | 1.6 | | 2.0 | | 2.0 | | V | 4.5 to 5.5 | | | | |
| V _{IL} | LOW level input voltage | | 1.2 | 0.8 | | 0.8 | | 0.8 | V | 4.5 to 5.5 | | | | |
| ±I _I | input leakage current | | | 0.1 | | 1.0 | | 1.0 | µA | 5.5 | V _{CC} or GND | | | |
| ±I _S | analog switch OFF-state current per channel | | | 0.1 | | 1.0 | | 1.0 | µA | 5.5 | V _{IH} or V _{IL} | V _S = V _{CC} - GND (see Fig.8) | | |
| ±I _S | analog switch OFF-state current all channels | | | 0.8 | | 8.0 | | 8.0 | µA | 5.5 | V _{IH} or V _{IL} | V _S = V _{CC} - GND (see Fig.9) | | |
| ±I _S | analog switch ON-state current | | | 0.8 | | 8.0 | | 8.0 | µA | 5.5 | V _{IH} or V _{IL} | V _S = V _{CC} - GND (see Fig.9) | | |
| I _{CC} | quiescent supply current | | | 8.0 | | 80.0 | | 160 | µA | 4.5 to 5.5 | V _{CC} or GND | V _{IS} = GND or V _{CC} ; V _{OS} = V _{CC} or GND | | |
| ΔI _{CC} | additional quiescent supply current per input pin for unit load coefficient is 1 (note 1) | | 100 | 360 | | 450 | | 490 | µA | 4.5 to 5.5 | V _{CC} -2.1 V | other inputs at V _{CC} or GND | | |

Note

1. The value of additional quiescent supply current (ΔI_{CC}) for a unit load of 1 is given here.
To determine ΔI_{CC} per input, multiply this value by the unit load coefficient shown in the table below.

| INPUT | UNIT LOAD COEFFICIENT |
|----------------|-----------------------|
| Ē | 0.6 |
| S _n | 0.5 |

16-channel analog multiplexer/demultiplexer

74HC/HCT4067

AC CHARACTERISTICS FOR 74HCT

GND = 0 V; $t_r = t_f = 6$ ns

| SYMBOL | PARAMETER | T _{amb} (°C) | | | | | | UNIT | TEST CONDITIONS | | | |
|-------------------------------------|--|-----------------------|------|------|------------|------|-------------|------|---------------------|-------|---|--|
| | | 74HCT | | | | | | | V _{CC} (V) | OTHER | | |
| | | +25 | | | -40 to +85 | | -40 to +125 | | | | | |
| | | min. | typ. | max. | min. | max. | min. | max. | | | | |
| t _{PHL} / t _{PLH} | propagation delay V _{is} to V _{os} ; Y _n to Z | | 9 | 15 | | 19 | | 22 | ns | 4.5 | R _L = ∞ ; C _L = 50 pF (see Fig.16) | |
| t _{PHL} / t _{PLH} | propagation delay V _{is} to V _{os} ; Z to Y _n | | 6 | 12 | | 15 | | 18 | ns | 4.5 | | |
| t _{PHZ} / t _{PLZ} | turn-off time E to Y _n | | 26 | 55 | | 69 | | 83 | ns | 4.5 | | |
| t _{PHZ} / t _{PLZ} | turn-off time S _n to Y _n | | 31 | 55 | | 69 | | 83 | ns | 4.5 | | |
| t _{PHZ} / t _{PLZ} | turn-off time E to Z | | 30 | 60 | | 75 | | 90 | ns | 4.5 | | |
| t _{PHZ} / t _{PLZ} | turn-off time S _n to Z | | 35 | 60 | | 75 | | 90 | ns | 4.5 | | |
| t _{PZH} / t _{PZL} | turn-on time E to Y _n | | 32 | 60 | | 75 | | 90 | ns | 4.5 | | |
| t _{PZH} / t _{PZL} | turn-on time S _n to Y _n | | 35 | 60 | | 75 | | 90 | ns | 4.5 | | |
| t _{PZH} / t _{PZL} | turn-on time E to Z | | 38 | 65 | | 81 | | 98 | ns | 4.5 | | |
| t _{PZH} / t _{PZL} | turn-on time S _n to Z | | 38 | 65 | | 81 | | 98 | ns | 4.5 | | |

Note

1. Due to higher Z terminal capacitance (16 switches versus 1) the delay figures to the Z terminal are higher than those to the Y terminal.

16-channel analog multiplexer/demultiplexer

74HC/HCT4067

ADDITIONAL AC CHARACTERISTICS FOR 74HC/HCT

Recommended conditions and typical values

GND = 0 V; $t_r = t_f = 6$ ns

| SYMBOL | PARAMETER | TYP. | UNIT | V_{CC} (V) | $V_{IS(P-P)}$ (V) | CONDITIONS |
|-----------|---|--------------|------------|-----------------|----------------------|--|
| | sine-wave distortion $f = 1$ kHz | 0.04 0.02 | % % | 4.5 9.0 | 4.0 8.0 | $R_L = 10$ k Ω ; $C_L = 50$ pF (see Fig.14) |
| | sine-wave distortion $f = 10$ kHz | 0.12 0.06 | % % | 4.5 9.0 | 4.0 8.0 | $R_L = 10$ k Ω ; $C_L = 50$ pF (see Fig.14) |
| | switch "OFF" signal feed-through | -50 -50 | dB dB | 4.5 9.0 | note 3 | $R_L = 600$ Ω ; $C_L = 50$ pF $f = 1$ MHz (see Figs 11 and 15) |
| f_{max} | minimum frequency response (-3 dB) | 90 100 | MHz MHz | 4.5 9.0 | note 4 | $R_L = 50$ Ω ; $C_L = 10$ pF (see Figs 12 and 13) |
| C_S | maximum switch capacitance independent (Y) common (Z) | 5 45 | pF pF | | | |

Notes

1. V_{IS} is the input voltage at Y_n or Z terminal, whichever is assigned as an input.
2. V_{OS} is the output voltage at Y_n or Z terminal, whichever is assigned as an output.
3. Adjust input voltage V_{IS} is 0 dBm level (0 dBm = 1 mW into 600 Ω).
4. Adjust input voltage V_{IS} is 0 dBm level at V_{OS} for 1 MHz (0 dBm = 1 mW into 50 Ω).

16-channel analog multiplexer/demultiplexer

74HC/HCT4067

Test conditions:
 $V_{CC} = 4.5$ V; GND = 0 V;
 $R_L = 50 \Omega$; $R_{source} = 1 \text{ k}\Omega$.

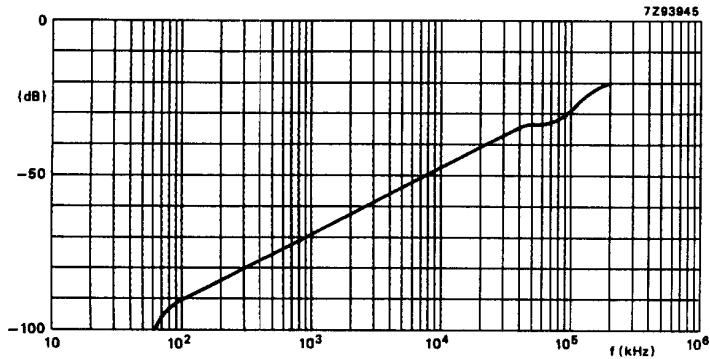


Fig.11 Typical switch "OFF" signal feed-through as a function of frequency.

Test conditions:
 $V_{CC} = 4.5$ V; GND = 0 V;
 $R_L = 50 \Omega$; $R_{source} = 1 \text{ k}\Omega$.

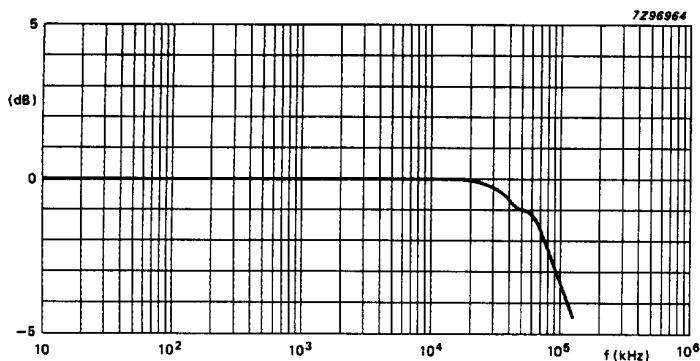


Fig.12 Typical frequency response.

Adjust input voltage to obtain
0 dBm at V_{os} when $f_{in} = 1$ MHz.
After set-up frequency of f_{in} is
increased to obtain a reading of
-3 dB at V_{os} .

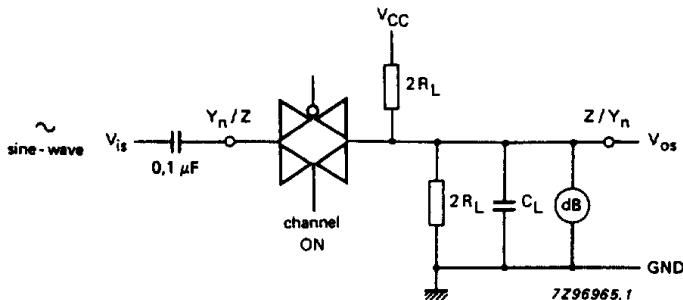
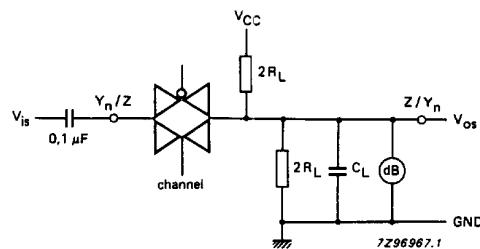
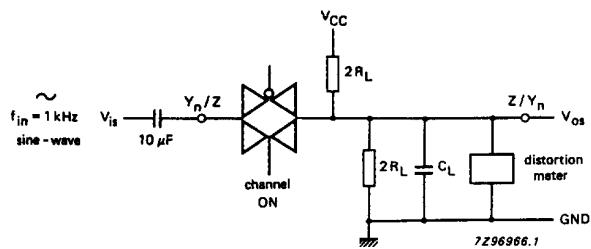


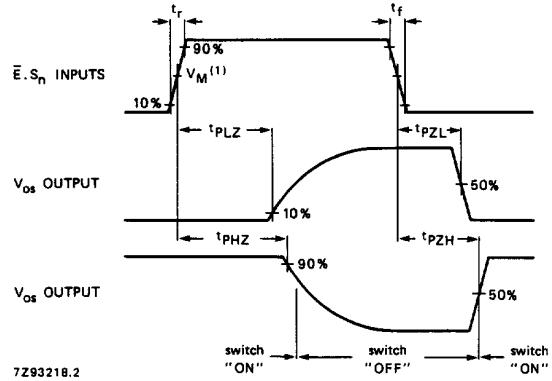
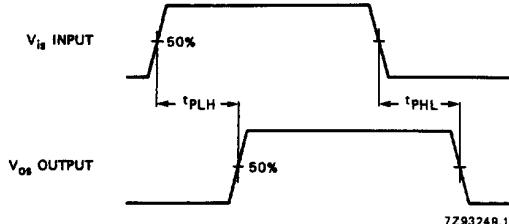
Fig.13 Test circuit for measuring minimum frequency response.

16-channel analog multiplexer/demultiplexer

74HC/HCT4067



AC WAVEFORMS



(1) HC : $V_M = 50\%$; $V_I = \text{GND to } V_{CC}$.
 HCT : $V_M = 1.3 \text{ V}$; $V_I = \text{GND to } 3 \text{ V}$.

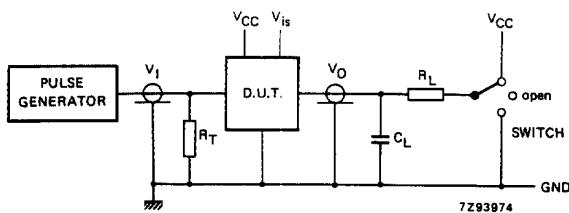
16-channel analog multiplexer/demultiplexer

74HC/HCT4067

TEST CIRCUIT AND WAVEFORMS

Conditions

| TEST | SWITCH | V_{IS} |
|-----------|----------|----------|
| t_{PZH} | GND | V_{CC} |
| t_{PZL} | V_{CC} | GND |
| t_{PHZ} | GND | V_{CC} |
| t_{PLZ} | V_{CC} | GND |
| others | open | pulse |

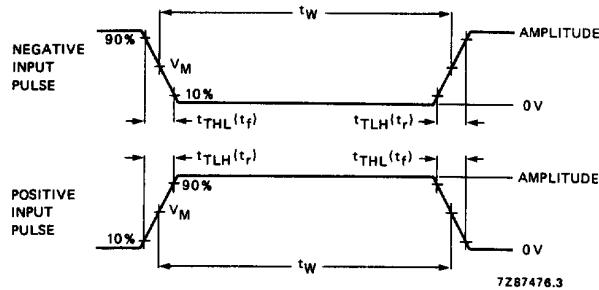


C_L = load capacitance including jig and probe capacitance (see AC CHARACTERISTICS for values).

R_T = termination resistance should be equal to the output impedance Z_O of the pulse generator.

t_r = $t_f = 6$ ns, when measuring f_{max} , there is no constraint on t_r , t_f with 50% duty factor.

Fig.18 Test circuit for measuring AC performance.



| FAMILY | AMPLITUDE | V_M | t_r, t_f | |
|--------|-----------|-------|---------------------------|-------|
| | | | $f_{max};$ PULSE WIDTH | OTHER |
| 74HC | V_{CC} | 50% | < 2 ns | 6 ns |
| 74HCT | 3.0 V | 1.3 V | < 2 ns | 6 ns |

Fig.19 Input pulse definitions.

PACKAGE OUTLINES

See "74HC/HCT/HCU/HCMOS Logic Package Outlines".